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Drought, fire, flood and COVID – complex systems and disruption

The 'cure' for maintaining the health of our human populations from COVID-19 has been halting social functioning, which is unravelling economic systems and damaging the livelihoods of many people. There will be winners and losers, and social institutions and economies may take long timeframes to recover. Indeed, they may not be the same again.

This is not dissimilar to the ecological consequences of Australia's recent bushfires. Building of ecosystems takes a long time if they are damaged to the extent caused by these fires, given that they followed extensive and broadscale drought and landscape drying. Over 1 billion mammals, birds and reptiles are likely to have been killed, according to calculations by Professor Chris Dickman whose interview on the subject is featured in this issue along with many other articles of value. Flooding rains followed rapidly in some cases, washing ash and soot into streams and rivers, realizing many of the losses in aquatic species anticipated by ecologists.

The Australian government's post-bushfire emergency response included food drops and fauna rescues for some species, not unlike the way society is now delivering economic stimulus and rescue packages for some businesses. This was rapidly followed by manipulations to reduce predation and competition, carried out in a manner not unlike the way financial assistance is being doled out to renters and mortgage holders. But, as Professor Dickman explains, there is in fact very, very little that we can do to help faunal populations recover once they have been hit so hard. Like in a complex economic system, the survival of ecosystems ultimately relies on the survival and reproductive capacity of the components and we hope to hell that the linkages that are so important can rapidly reconnect if severed. It is likely in this case, however, that the damage to fauna will prove to be very high and will have long-term repercussions.

If a complex system cannot recover it changes shape. Changing shape can be a good thing if it improves our social and economic 'work in progress' – for example by reducing excessive global connectivity, revaluing regional and local industry and nurturing social relationship. But the same cannot be said for ecosystems that are works of nature, upon whose former shape we depend. The work of humans in this situation is not so much to find ways to change nature but to find ways that we can reduce our impacts upon it so that it can persist and repeat catastrophes can be averted.

There are myriad small ways to reduce potential impact during and immediately after wildfire and even strategies available to establish insurance populations of threatened species in advance of catastrophes, as outlined in the Threatened Species Recovery Hub blueprint (Dickman *et al.* 2020), cited in the Dickman interview. But the two main causal factors of the impact of the recent fires cannot continue to be ignored and require enormous effort and creativity to collectively address. These are our impact upon climate, causing increased drying and thereby the extent of fires – and the total area and configuration of our land clearing, causing fragmentation of habitats and thereby reducing potential for fauna recolonization.

The temporary 'absence' of humans during the global COVID-19 pandemic has been good for nature, but our complete absence should not be necessary to conserve ecosystems. There may well be ways that humans can limit our impacts and interact with the rest of nature without putting our civilization or ecosystem at risk. Such ways may, interestingly, have their roots in ways our forebears related to each other and the rest of nature, evidenced by cultural practices that many Indigenous and traditional societies still maintain. Indigenous patch burning coupled with western science, in particular, offers insights into ways Australians could potentially create habitat mosaics without causing more fragmentation. Reconnecting habitats at a landscape level is still possible and necessary without causing further risk to humans and can be part of the solution to the carbon emission crisis. But this can only be successful if we simultaneously and collectively reduce global warming and its consequences through a radical change to economic systems that reduce land clearing and dependence on fossil fuels, alternatives to which appear to be distinctly possible.

Our economic system has suffered a massive shock. The difference between creative disruption and damage is whether we can learn from it and rebuild our economies in ways that better serve the needs of both humans and the rest of nature.

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Reference

Dickman C., Driscoll D., Garnett S.*et al.*(2020) After the catastrophe: a blueprint for a conservation response to large-scale ecological disaster, Threatened Species Recovery Hub, January 2020.

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